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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/579,141

12/28/2006

Shigemasa Suga

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6382

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BIRCH STEWART KOLASCH & BIRCH  
PO BOX 747  
FALLS CHURCH, VA 22040-0747

EXAMINER

WEBB, GREGORY E

ART UNIT

PAPER NUMBER

1796

NOTIFICATION DATE

DELIVERY MODE

08/22/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/579,141	<b>Applicant(s)</b> SUGA ET AL.	
	<b>Examiner</b> Gregory E. Webb	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 April 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments filed have been fully considered but they are not persuasive.
2. The applicant argues that Morinaga fails to teach the use of fluoride. However this is not the case.
3. Morinaga clearly teaches the use of hydrogen fluoride (aka hydrofluoric acid) as an "others" ingredient. This can be seen in section 4 of the patent:
4. "(4) Others  
An amine such as ethylenediamine, 8-quinolinol or o-phenanthroline; a carboxylic acid such as formic acid, acetic acid, oxalic acid or tartaric acid; a **hydrogen halide such as hydrofluoric acid**, hydrochloric acid, hydrogen bromide or hydrogen iodide, or salts thereof; an oxo acid such as phosphoric acid or condensed phosphoric acid, or salts thereof."
5. The applicant further argues that the phosphoric acid and hydrofluoric acid would not be in the same composition. However the above paragraph demonstrates that this too is not true.
6. The examiner agrees with the arguments presented with respect to the Nohara reference and as such removes these rejection.
7. Concerning the Sakon reference, the applicant argues the compositions containing phosphoric acid are comparative and not preferred. Although this may be

true, the reference is considered by the examiner as a whole. Comparative examples can anticipate the applicant's claims.

8. Concerning the applicant's argument that the phosphoric acid is outside of the claimed range, the examiner does not agree with the calculations present. Such argued differences in concentration however do not render the instant claim allowable as it would be at least obvious to vary the concentrations of the phosphoric acid as such routine modifications are well within the ordinary skill of any chemist.

9. The examiner agrees with the arguments presented with respect to the Verhaverbeke reference and as such removes these rejection.

#### DETAILED ACTION

##### *Claim Rejections - 35 USC § 102/103*

10. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. Claims 1-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Morinaga (US 6,896,744).

Concerning the phosphoric acid, Morinaga teaches the following:

An amine such as ethylenediamine, 8-quinolinol or o-phenanthroline; a carboxylic acid such as formic acid, acetic acid, oxalic acid or tartaric acid; a hydrogen halide such as hydrofluoric acid, hydrochloric acid, hydrogen bromide or hydrogen iodide, or salts thereof; an oxo acid such as **phosphoric acid** or condensed **phosphoric acid**, or salts thereof. (*emphasis added*)

Concerning the hydrofluoric acid, Morinaga teaches the following:

In order to control such etching of SiO<sub>2</sub>, a cleaning method is also proposed wherein, although the cleaning time is the same as before, the **hydrofluoric acid** concentration is extremely reduced, and for example, the substrate surface is

cleaned with an extremely dilute hydrochloric acid aqueous solution having a very small amount at a level of e.g. 10 wt ppm of **hydrofluoric acid** added to pure water (JP-A-3-190130, etc.). However, by such a cleaning method, since the **hydrofluoric acid** concentration is extremely low, it requires about 5 minutes for only cleaning with this **hydrofluoric acid** aqueous solution, whereby the production efficiency is still low. In addition, in a case where this method is applied to a sheet cleaning apparatus, a large amount of the cleaning agent will be required, and accordingly a large amount of an acid waste liquid will be formed, and its disposal will be problematic. (*emphasis added*)

Concerning the ammonia/amine, Morinaga teaches the following:

The alkaline cleaning agent to be used in the present invention is an aqueous alkaline solution containing an alkaline component and having a pH value exceeding 7. The alkaline component in the solution is not particularly limited, but, as typical ones, **ammonium hydroxide** (an aqueous **ammonia** solution) and an organic alkali may be mentioned. As the organic alkali, a quaternary **ammonium hydroxide**, or an amine such as amine or amino alcohol, may be mentioned. As the quaternary **ammonium hydroxide**, one having an alkyl group having from 1 to 4 carbon atoms and/or a hydroxyalkyl group, is preferred. As the alkyl group, an alkyl group having from 1 to 10 carbon atoms, such as a methyl group, an ethyl group, a propyl group or a butyl group, may be mentioned. As the hydroxyalkyl group, a hydroxyalkyl group having from 1 to 10 carbon atoms, such as hydroxymethyl, hydroxyethyl, hydroxypropyl or hydroxybutyl, may be mentioned. As such a quaternary **ammonium hydroxide**, tetramethyl**ammonium hydroxide** (TMAH), tetraethyl**ammonium hydroxide**, trimethyl(hydroxyethyl)**ammonium hydroxide** (so-called choline) or triethyl(hydroxyethyl)**ammonium hydroxide** may, for example, be specifically mentioned. As other amines, ethylenediamine, monoethanolamine, trimethanolamine, etc., may be mentioned. (*emphasis added*)

Concerning the chelate agent, Morinaga teaches the following:

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Among the above-mentioned complexing agents, from such reasons as the cleaning effects, chemical stability, etc., a nitrogen-containing carboxylic acid such as ethylenediamine tetracetic acid (EDTA) or diethylenetriamine pentacetic acid (DTPA); a nitrogen-containing phosphonic acid such as nitrilotris(methylenephosphonic acid) (NTPO), ethylenediaminetetrakis(methylenephosphonic acid) (EDTPO) or propylenediaminetetra(methylenephosphonic acid) (PDTMP); ethylenediamine di-o-hydroxyphenyl acetic acid (EDDHA) and its derivatives; and N,N'-bis(2-hydroxybenzyl)ethylenediamine-N,N'-diacetic acid (HBED) are, for example, preferred. (*emphasis added*)

Concerning the hydrogen peroxide, Morinaga teaches the following:

To the alkaline cleaning agent to be used in the present invention, an oxidizing agent such as **hydrogen peroxide**, ozone or oxygen, may optionally be incorporated. In a case where in a process for cleaning a semiconductor device substrate, the surface of a bare silicon substrate (a silicon substrate having no oxide film) is to be cleaned, it is possible to control etching or surface roughing of the substrate by incorporating an oxidizing agent. When **hydrogen peroxide** is to be incorporated to the alkaline cleaning agent to be used in the present invention, it is usually employed so that the concentration of **hydrogen peroxide** in the entire liquid of the cleaning agent will be within a concentration range of from 0.001 to 5 wt %, preferably from 0.01 to 1 wt %. (*emphasis added*)

2. Claims 1-10 are rejected under 35 U.S.C. 102(b) as being anticipated or alternatively as being rendered obvious under 35 U.S.C. 103(a) by Sakon (US5560857).
3. Sakon teaches various concentrations of the additives presented in the example. It would have been obvious for one skilled in chemistry to vary the concentrations of these additives.

Concerning the phosphoric acid and the ammonia, Sakon teaches the following:

3. The solution according to claim 2, wherein said acid is selected from the group consisting of **phosphoric acid**, sulfuric acid, nitric acid, trichloroacetic acid, dichloroacetic acid, hydrochloric acid, monochloroacetic acid and acetic acid, and said salt is selected from the group consisting of ammonium salts and amine salts, and the base is selected from the group consisting of **ammonia** and amines. (*emphasis added*)

Concerning the hydrofluoric acid, Sakon teaches the following:

The results of the Comparative Examples where the cleaning solution differs from those of the present invention in the concentration of **hydrogen fluoride**, the concentration of hydrogen peroxide, and the level of pH as well as having no **hydrogen fluoride**, were used to effect cleaning, followed by rinsing, are also given in Table 1 (Numbers 48 to 62). (*emphasis added*)

Concerning the hydrogen peroxide, Sakon teaches the following:

Comparative Example 50 indicates that the characteristics of the cleaning solution of the present invention may be retained even at a content of **hydrogen peroxide** in excess of 20% by weight. However, such high content of **hydrogen peroxide** is not only disadvantageous in cost, but also undesirable from a safety viewpoint because of evolution of oxygen gas through decomposition of **hydrogen peroxide**. (*emphasis added*)

### **Conclusion**

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory E. Webb whose telephone number is 571-272-1325. The examiner can normally be reached on 9:00-17:30 (m-f).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon can be reached on 571-272-1498. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Gregory E. Webb/  
Primary Examiner, Art Unit 1796

Gregory E. Webb  
Primary Examiner  
Art Unit 1796

gew